SAMPLE TASKS

As described in Section L.9 (a) (2) f, Sample Tasks, provide a detailed response to the Sample Tasks. Provide your approach to and the estimated resources required for performing the task but do not provide actual deliverables. For Sample Task 1, provide a detailed technical plan, including technical approach, skill sets and resources required, and estimated cost. For Sample Tasks 2-5, describe only the management process, options, issues, and approaches as described below in "II. Heatshield Design Under Special Conditions".

I. Heatshield Design

Sample Task 1 - TPS DESIGN FOR MARS ASTROBIOLOGY FIELD LABORATORY

PERIOD OF PERFORMANCE: 12 months

1. GOALS:

Apply computational tools and diagnostic capabilities to design efficient thermal protection systems for aerospace entry vehicles.

2. GENERAL DESCRIPTION OF REQUIRED SERVICES:

The design of the thermal protection system (TPS) for the Mars Astrobiology Field Laboratory (AFL) entry vehicle will require thorough definition of the aerothermal environment that the vehicle will experience throughout atmospheric entry, as well as the thermal response of the materials to that environment. The required analysis efforts encompass both the flight environment and ground test environment where the materials are tested and certified, most often in high enthalpy arc jets. This task will require the proper modeling of the aerothermal environment with computational fluid dynamics and thermal response tools. The CFD and radiative heating solutions are to be computed and thermal response modeling will be performed. From these results, the weight, size and characteristics of the TPS are developed, and the impact on overall vehicle performance is assessed.

DELIVERABLE: Perform trade studies and the design of the heatshield for one configuration of the AFL.

DELIVERABLE: Identify advanced materials capabilities that are required to accomplish the recommended design.

3. GOVERNMENT-FURNISHED EQUIPMENT AND SERVICES:

Ames Research Center will furnish office space and equipment, computer resources, laboratory equipment and laboratory space for the direct performance of this task. The major experimental facilities involved in this work are the Ames Research Center Arc Jet Complex and the range complex. A collection of laboratories is also dedicated to the development of thermal protection materials. The computational resources include

local terminals, personal computers, high performance workstations, and licenses for commercial software and use of Government “off-the-shelf” software. Access to these facilities will be provided as necessary and will be shared with other NASA research programs requiring access. Refer to attachment J.1 (a) 3.

II. Heatshield Design Under Special Conditions

The following situations describe different staffing and other management challenges that may typically be faced when a new technical task is assigned. For each of the situations listed below, describe **only your management process** for planning, staffing, and responding to Sample Task 1.

For staffing, schedule and cost considerations, describe potential options that you would explore; the considerations that would go into the decision process and what that decision process would be, including risk and cost analysis and other issues; your preferred approach and the actions that you would need to take upon the selection of that approach; and your monitoring and task management process and any special issues that would be introduced to task management by the selection of your preferred approach.

Sample Task 2 - The task is expected to be an ongoing one. All appropriate experts on the contract are already working full time on other Division tasks.

Sample Task 3 – This is a short-term task. The requirement is for delivery of the product in 4 months from the date of the task request – with no anticipated follow-on. All appropriate experts **on the contract** are already working full time on other efforts.

Sample Task 4 - This is a short-term task. The requirement is for delivery of the product in 4 months from the date of the task request – with no anticipated follow-on. There are no appropriate experts **within the company** who are not working full time on another effort.

Sample Task 5 – The task is underway and the Task Manager resigns. Describe actions that would be taken by the management.